

10. SPECIAL INVESTIGATIONS

10.1. Acoustic monitoring of zooplankton (abundance and distribution)

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Aim of investigations

The overall aim of this special investigation was to develop methods and procedures for the routine estimation of zooplankton abundance and distribution in Norwegian waters using acoustic techniques, with an initial focus on the Barents Sea. The particular objectives for the 2012 ecosystem survey were:

to collect multi-frequency echosounder data

to carry out targeted identification trawls on zooplankton marks

to collect MS70 sonar data in three defined areas

The multi-frequency acoustic data and targeted trawls will be used to estimate zooplankton abundance and distribution for the Barents Sea via a conventional echo-integration analysis.

The MS70 sonar data will be used to estimate the sampling efficiency of the echosounder data by comparing numbers and spatial densities of zooplankton aggregations observed by the echosounder and MS70 in three areas (shallow western, deeper region associated with Atlantic inflow, and an eastern area).

Equipment

The equipment used in this investigation was:

Simrad EK60 multi-frequency echosounders

Simrad MS70 3D sonar

Krill trawl

MOCNESS

Harstad trawl

Procedure

Standard echo-integration techniques will be used to analyse the acoustic data using LSSS.

Trawl catches will be used to broadly partition the zooplankton marks into species groups.

The PROMUS software will be used to analyse the MS70 data to yield estimates of zooplankton school size and distribution.

Data & Results

Multi-frequency echosounder data was collected for the entire ecosystem survey area. MS70 data was collected in the three desired areas (**Figure 10.1.1**). Thirteen non-targeted MOCNESS tows, eleven non-targeted krill trawls, and 328 Harstad trawls were carried out, which will be used to assist with acoustic categorisation.

Analysis of the data has not begun. It is expected that estimates of zooplankton abundance and distribution will be available at the end of March 2013.

Plans for future surveys

We wish to repeat the work in 2013 to continue to develop the method and to start a time-series of zooplankton abundance and distribution using acoustic techniques. A significant improvement in future surveys would be to carry out targeted trawls on zooplankton marks. The further development of semi-automated zooplankton classification methods would make the analysis more efficient and reliable.

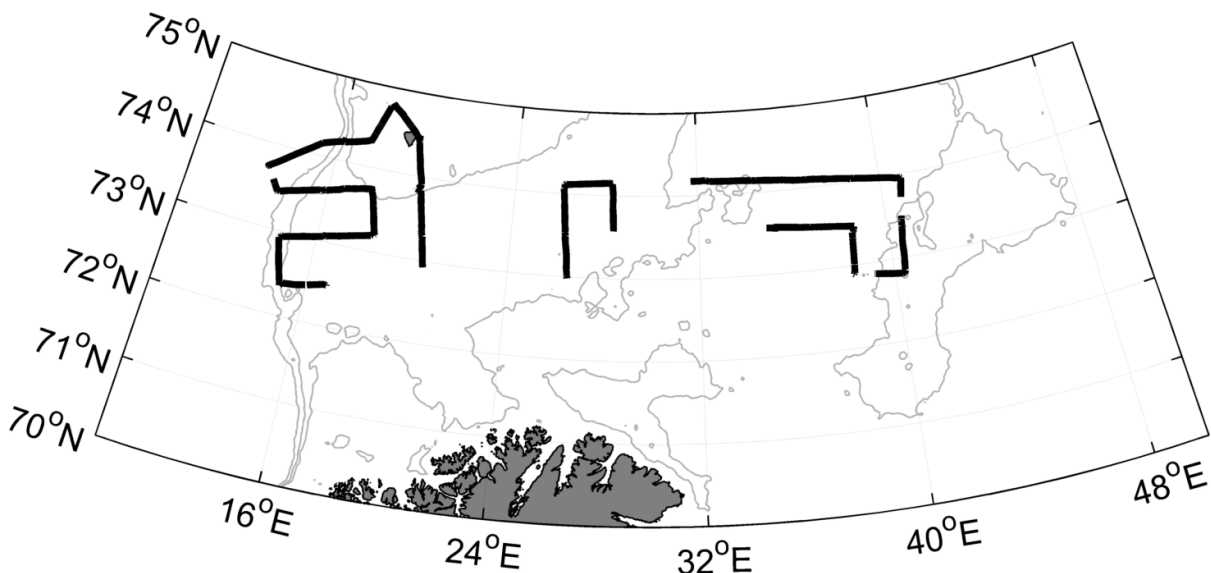


Figure 10.1.1. The vessel track lines where MS70 acoustic data were collected.